Unit 16
Day 5
Evaluating Logarithms
Section 5.4

(60) $\log_2\left(\frac{2\sqrt{3}}{5}\right)$

$\log_2 2\sqrt{3} - \log_2 5$

$\log_2 2(3)^{1/2} - \log_2 5$

$\log_2 2 + \log_2 3^{1/2} - \log_2 5$

$\log_2 2 + \frac{1}{2}\log_2 3 - \log_2 5$

$1 + \frac{1}{2}\log_2 3 - \log_2 5$

COMMON LOGARITHMS

The bases 10 and e are so important for logarithms that scientific and graphing calculators have keys for these bases.

For now on, we will abreviate $\log_{10} x$ as $\log x$.

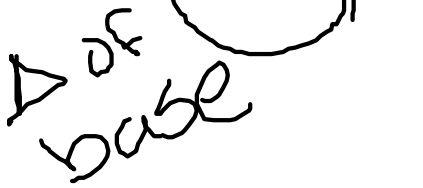
$\ln x$

natural log $\Rightarrow$ base e

CHANGE-OF-BASE THEOREM

For any positive real numbers x , a , and b , where $a \neq 1$ and $b \neq 1$:

$$\log_a x = \frac{\log_b x}{\log_b a}$$



Use the change-of-base theorem to find an approximation for each of the following logarithms. Give the answer to four decimal places.

1) $\log_6 3 = \frac{\log 3}{\log 6} = .6131$

OR $\frac{\ln 3}{\ln 6}$

2) $\log_2 5 = \frac{\log 5}{\log 2}$

$= 2.3219$

3) $\log_7 28$

$= \frac{\log 28}{\log 7} = 1.7124$

4) $\log_5 180$

$= \frac{\log 180}{\log 5} = 3.2266$

4) $\log_3 142$

$$\frac{\log 142}{\log 3} = 4.5110$$

5) $\log_{16} 27$

$$\frac{\log 27}{\log 16} = 1.1887$$

HOMEWORK

Day 5 p. 392: 35-42
Review p 416: 9-32, 39-42, 54-58